REMARKS

Applicant expresses appreciation to the Examiner for consideration of the subject patent application. This amendment is in response to the Office Action mailed October 5, 2004. Claims 1-30 were pending and claims 1-30 were rejected. Claims 1, 15 and 21 have been amended and claim 22 has been canceled. Claims 1-21, 23-30 remain in the application.

35 U.S.C. § 102(b) Anticipation Rejections

The Examiner has rejected Claims 1-30 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,557,596 (Gibson 596). 35 U.S.C. § 102(b) requires that:

> "a person shall be entitled to a patent, unless . . . (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States . ."

M.P.E.P. 706.02 sets forth the standard for a § 102(b) rejection:

> "For anticipation under 35 USC 102, the reference must teach every aspect of the claimed invention either explicitly or impliedly. Any feature not directly taught must be inherently present."

It should be noted that the Gibson 596 patent was cited and distinguished in the present application. The Gibson 596 patent focused on using electron emitters generating beams of electrons in a data storage system to impact and change the state of storage material, which would then be detected in a carrier flow in any of several different detection devices described therein. Moreover, the Gibson 596 patent uses electron beams to detect the state of the written storage areas. The Gibson 596 patent does not disclose or teach the use of light beam emitters for either writing or detecting data in a data storage system.

Several limitations arise with the use of electron beams, including dielectric breakdown, field emission from undesirable locations and the need for relatively large and expensive power supplies. As stated on page 3, lines 5-17 of the present application:

> "It is possible to use low energy electrons in this technique to avoid problems with dielectric breakdown, field emission from undesirable locations, and the need for relatively large and expensive power supplies. However, low energy electrons have very short penetration depths, making this approach highly susceptible to the surface

conditions of the medium. Moreover, only very thin layers may be present on the top of the storage media, making difficult the use of a protective layer or a conducting electrode on top of the storage layer. In addition, the stability and cyclability of a storage device using electron-readback may be limited by the mechanical and thermal properties of the free surface of the storage medium. Only very thin protective cladding layers can be used with a low-energy electron-beam addressing scheme, as these layers would prevent access by low energy electrons."

The present invention utilizes light beam emitters, rather than electron emitters, to overcome some of these limitations. The entire invention is concerned with responses to light beams generated from light beam emitters, rather than electron beams. As stated on page 4, lines 27-32:

> "The plurality of states exhibit substantial differences in their responses to light beams during a read phase. This difference may relate to (1) the nature of light absorption and/or light reflection of the medium in its different states, (2) the capability of the states for carrier generation or recombination and/or (3) the impact of the states on local electric fields that, in turn, influence the generation and recombination of carriers."

The use of light beams, rather than electron beams, enables a layer adjacent to the storage layer (LASL) to be positioned beneath a storage layer, since light, unlike electrons, can penetrate through the storage layer to the LASL. Accordingly, the LASL may be used with the storage layer to determine the response characteristics of the detection device.

In the present invention, the LASL is used primarily to generate or multiply carriers in the data detection device. In contrast, in the Gibson 596 patent, the storage layer alone generates carriers from an electron beam. Accordingly, the use of the LASL to generate carriers from a light beam generated by a light beam emitter is an important aspect of the present invention.

The LASL may be positioned above the storage layer or beneath the storage layer. When positioned beneath the storage layer, the LASL may be utilized to generate carriers according to the amount of light that reaches the LASL <u>from a light beam emitter</u> after passing through the storage layer. The storage layer acts as a filter, with the amount of light coming to the LASL being dependent on the state of the data storage areas in the storage layer. When the LASL is positioned above the storage layer, the LASL may also be utilized to generate carriers according to the amount of light reaching the LASL, <u>again from a light beam emitter</u>. In this case, the

storage layer acts as a filter after carriers are generated by the LASL, the storage layer filtering the amount of carriers reaching a detection junction, depending on the state of the storage areas in the storage layer.

No such arrangement is disclosed in the Gibson 596 patent. There is no filtering function disclosed by the structures shown in Gibson 596, either by a storage layer or adjacent layer. Further, there is no disclosure in Gibson 596 of a LASL that generates carriers from light reaching the LASL from a light beam emitter. The unnumbered layer shown in Figure 5 of the Gibson 596 patent does not function as the LASL in the present invention. In Figure 5, the storage layer 352 is a photoluminescent material that generates photons in response to the impact of electrons. There is no disclosure of a light emitter directing a light beam to the storage layer or of light from the light emitter penetrating to a LASL to generate carriers, as in the present invention.

Likewise, Figures 4A and 4B of the Gibson 596 patent does not show the present invention. Figure 4A shows a storage layer having a storage area that is impacted by electron beams, not light beams (see column 6, lines 58-67). Moreover, a top layer 277 above the storage layer does not act as a LASL to generate carriers in response to a light beam. Rather layer 277 is made of a "poor" oxide material, that is an oxide that has a high recombination rate. The focus is on striking the oxide layer with electron beams to modify recombination rate, rather than using light beams to generate carriers in the layer. In Figure 4B, a hydrogenated amorphous silicon layer 307 is superimposed over a crystalline silicon layer 306. The storage area 308 is in top layer 307, generated by changing defects or doping in the layer, using electron beams. Layer 306 beneath storage layer 307 does not function like the LASL of the present invention, in that it does not generate carriers in response to a filtering action of the storage layer.

<u>The Claims of the Present Application</u>

Referring to the claims, Claim 1 includes a light beam emitter for directing a beam of light towards the data storage layer. It also includes a LASL that generates carriers in response to the amount of light from the light beam emitter that reaches the LASL. Such a combination is clearly not shown or anticipated in Gibson 596. Claim 2 is dependent on claim 1 and is therefore

allowable. Claim 3 is likewise allowable, since it is dependent on claim 1. Further, claim 3 describes a storage layer that acts as a variable light absorber, depending on the state of the storage layer. The Gibson 596 patent does not disclose a storage layer that acts as a variable light absorber. Similarly, claim 4 describes the storage layer as a variable reflector, which is not shown in the reference.

Claims 4-6 are also dependent on claim 1, and are allowable for that reason. Claims 7 and 8 are also dependent on claim 1, through claim 2, and further describes the LASL as a photoconductor with first and second electrodes and a detection region. Such a structure is clearly not shown in Gibson 596. Claims 9-14 are also allowable as being dependent on claim 1, and further claim the LASL as a photoluminescent layer, which is not shown in the reference. In Gibson 596, Figure 5, the storage layer is a photoluminescent layer and the adjacent layer does not function to generate carriers from a light beam generated from a light beam emitter. Further, claim 10 includes a limitation of the storage layer acting as a variable filter of the light reaching the LASL, not shown in the Gibson reference. Claim 11 describes the LASL as converting the wavelength of the light beam from the emitters to photons having a wavelength that is conducive to detection. Likewise, claim 13 describes a LASL that converts the light beam wavelength to light having a wavelength that is conducive to the storage layer. No such light wavelength conversion structure or function is shown in Gibson 596.

Claim 15 is an independent method claim that also describes a light beam from a light beam generator being emitted towards a LASL and the storage layer. The method also includes the generation of carriers by the LASL corresponding to the amount of light reaching the LASL from the light beam emitter. No such method is shown or disclosed in Gibson 596. Claims 16 and 17 are dependent on claim 15 and are therefore also allowable. Further, claim 16 describes the storage layer affecting the carrier flow by filtering the amount of light that reaches the LASL. As discussed above, such a method is not shown in the Gibson reference.

Claims 18 and 19 are dependent on claim 17 and are therefore allowable. Further, claim 18 claims a LASL acting as a photoconductor, not shown in Gibson 596. Likewise, claim 19 is directed to a LASL functioning as a photoluminescent layer, which is not shown in Gibson 596.

Claim 21 has been amended to describe a LASL that generates carriers in accordance to the amount of light reaching the LASL from the light beam emitter. Such a structure is not shown in Gibson 596. Claim 22 has been canceled. Claims 23-27 are dependent on claim 21, and are therefore allowable. In addition, claim 23 describes the storage layer as a variable light filter. Claim 24 claims the LASL as a protective cover for the data storage layer. Claim 25 claims the LASL as a diffusion barrier for the data storage layer. Claim 26 claims the LASL as a thermal layer, and claim 27 describes the LASL as facilitating the growth of the data storage layer. Gibson 596 does not disclose any of these structures.

Claim 28 is an independent claim describing a storage layer in a data storage unit having a storage area that changes between two states to provide a substantial contrast between the states in light filtering characteristics. Gibson 596 does not describe or disclose a storage layer having storage areas that function as light filters, varying according to state. Thus, claim 28 clearly distinguishes over the Gibson 596 patent. Claims 27 and 28 are dependent on claim 28 and are allowable for that reason. In addition, claim 29 describes a storage layer having a storage medium that provides substantial contrast between states in light absorbing characteristics. Claim 30 claims a storage layer having a storage medium that provides substantial contrast between states in light reflecting characteristics. The Gibson 596 patent clearly does not disclose such a data storage medium.

CONCLUSION

In light of the above amendments and comments, Applicant respectfully submits that pending claims 1-21, 23-30 are now in condition for allowance. Therefore, Applicant requests that the rejections be withdrawn, and that the claims be allowed and passed to issue. If any impediment to the allowance of these claims remains after entry of this Amendment, the Examiner is strongly encouraged to call Vaughn North at (801) 566-6633 so that such matters may be resolved as expeditiously as possible.

The Commissioner is hereby authorized to charge any additional fee or to credit any overpayment in connection with this Amendment to Deposit Account No. 08-2025.

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Respectfully submitted,

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